

A Review : A Pharmacological Review on Hibiscus Rosa-sinensis

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Abstract: *The present study of pharmacological review of Hibiscus roseus. Hibiscus is rosasinensis Linn. Having family Malvaceae. The chemical constituents of hibiscus roseus contain tannins, flavonoids, alkaloids, terpenoids, saponins, cardiac glycoside proteins, and free amino acid, carbohydrates reducing sugar, essential oils and steroids. The study on hibiscus roseus that shows the pharmacological activities such as it acts as a anti-inflammatory, anticonvulsant, antipyretic, antiparasitic, dermatological, antimicrobial, antitussive, neuroprotective, antioxidant and antidiabetic. The current review will discuss the chemical constituents, pharmacological activities and importance of hibiscus roseus.*

Keywords: Hibiscus roseus, pharmacological, therapeutic, chemical constituents etc.

I. INTRODUCTION

Many plants contains the secondary metabolites which contains the organic constituents that are not normally involved in normal growth and development of organism but often play important role in plant Defense [1]. Hibiscus roseus belonging to family Malvaceae and class magnoliopsida means the plant produce from seeds. There are 300 species of the genus hibiscus. Traditionally Hibiscus flower has been reported it should be used as a analgesic antioxidant Anti diabetic anti inflammatory, anti diabetic, anti microbial, Anti tumor, antimodulatory, memory enhancement, hepatoprotective, antitussive, dermatological, urinary, fibrinolytic and many other effects [2]. Many of them have played important role in the pharmacological effect and developing better therapeutic effect for various disease.[3]

Plant Profile:

Synonyms : Hibiscus arnottii Griff. ex Mast.; Hibiscus boryanus DC.; Hibiscus cooperi auct.; Hibiscus festalis Salisb., Hibiscus liliiflorus Griff. ex Mast., Hibiscus rosiflorus Stokes and Hibiscus storckii Seem.

Taxonomic classification:

Kingdom: Plantae
Subkingdom: Tracheobionta
Superdivision: Spermatophyta
Division: Magnoliophyta
Class: Magnoliopsida
Subclass: Dilleniidae
Order: Malvales
Family: Malvaceae,
Genus: Hibiscus,
Species: Hibiscus rosa-sinensis[4]

Common Names

Arabic: Bent EL-Kunsil, Ward El-Jemal, Khatmah Siniyah, Hab misk Seni, Pooq Seni; Chinese: Zhu jin, Da hong hua, Fo sang, Fu sang; English: China-rose, Chinese hibiscus, Hawaiian hibiscus, hibiscus, rose-of-China; French: Hibiscus de Chine, Hibiscus rose de Chine, Rose de Chine; German: chinesisches Roseneibisch; Italian: Rosa della Cina; Japanese: Aka-bana, Fusou, Haibisukasu; Portuguese: rosa-da-China; Spanish: clavel japonés; Swedish: hibiscus.

Distribution:



Figure 1: Hibiscus Rosa-sinensis

In Hindi Hibiscus rosa sinensis is known as gurhal. The common name of Hibiscus rosa sinensis are tropical hibiscus, Chinese hibiscus. It belongs to the Malvaceae family. This is a glabrous shrub and widely cultivated in tropics. In India it is a perennial ornamental shrub which is available easily. The height of the plant is between 7 to 12 feet and spread from 6 to 10 feet. There are so many. Pharmacological and pharmaceutical importances of Hibiscus rosa sinensis. It shows various pharmacological activities such as aphrodisiac, laxative, oral. Contraceptive, menorrhagic, antioxidant etc. This plant also possesses anti-fertility activity. The mucilage isolated from the leaves of Hibiscus rosa sinensis was homogeneous on electrophoresis. It contains acidic polysaccharide and showed considerable anticomplementary activity [5].

Chemical Constituents

The edible portion of the flower (61.6 %) was reported to have the following nutrient composition (per 100 g): moisture 89.8 %, nitrogen 0.064 %, fat 0.36 %, crude fiber 1.56 %, calcium 4.04 mg, phosphorus 26.68 mg, iron 1.69 mg, thiamine 0.031 mg, riboflavin 0.048 mg, ascorbic acid 4.16 mg and niacin 0.61 mg. Petals of Hibiscus rosa-sinensis were reported to contain quercetin-3-di-O-β-D-glucoside; quercetin-3-7-di-O-β-D –glucoside; quercetin-3-O-β-D-sophorotrioside; and kaempferol and kaempferol-3-O-β-xylosylglucoside. The major anthocyanin contained in the red flowers of H. rosa-sinensis was cyanidin-3-sophoroside. Red-petalled varieties of H. rosa-sinensis were found to have more number of anthocyanin bands compared with that observed in yellow-yellow orange varieties. The varieties in the different coloured groups differed in the quantitative distribution of anthocyanins, leucoanthocyanins, flavonol and carotenoids. Flavonoid aglycones found in the flowers (per gm fresh tissues) included quercetin 7 mg and cyanidin 36 mg. The flowers were also reported to contain the following flavones: quercetin-3-diglucoside, quercetin-3, 7-diglucoside, cyanidin-3, 5-diglucoside and cyanidin-3-sophoroside-3-5 glucoside from deep yellow and white flowers and from ivory white flowers is kaempferol-3- xylosylglucoside. Leaves and stems contain β-sitosterol, stigma sterol, taraxeryl acetate and three cyclopropane compounds And their derivatives. Fatty acids, fatty alcohols and hydrocarbons were identified from Hibiscus rosa Sinensis leaves. Quercetin, β-sitosterol and linoleic acid can be selected as bioactive markers for Quantification of Hibiscus rosa sinensis flower.[6]

Table 1: Chemical constituents

Sr.no	Plant Part	Chemical constituents
1.	Flowers	Thiamine, Riboflavin, Niacin and Ascorbic acid, Apigenidin, citric acid, fructose, glucose, oxalic acid, pelargonidin, quercetin.
2.	Leaves	Alkaloids, glycosides, reducing sugars, fatty materials, resin and sterols, Fatty acids, fatty alcohol, and hydrocarbon, sterculic and malvalic acid.

3.	Roots	Glycosides, tannins, phytosterols, fixed oils, fats, proteins, amino acids, flavonoids, Saponins, gums and mucilage.
4.	Stem	Teraxeryl acetate, β -sitosterol and the cyclicacids sterculic and malvalic acids.

Traditional Uses

Hibiscus rosa sinensis has been used in Siddha medicine, a traditional Tamil system from South India, for many centuries. Hibiscus extracts have been used for ages in Ayurveda to cure many ailments. The plants have the natural health benefit that can be used to cure diseases naturally. They are used to cure ailments such as cough cold, hair loss and hair greying also. The flowers and leaves of this plant play a major role in hair treatment. These are ground into a fine paste with water and this is generally used as a shampoo plus conditioner. The plant also helps to improve the overall texture and health of hair. Hibiscus is a sweet sour herb and is used in the preparation of herbal teas. It acts as an antioxidant and also helps in the reduction of cholesterol levels. It has also been used in the traditional medicine for treating colds, loss of appetite, disorders of the respiratory tract. The plant is beneficial as a mild laxative, expectorant and diuretic. The hibiscus Rosa sinensis has been found to have emmenagogue effects which can stimulate menstruation and in some women, cause an abortion.

Pharmacological Activities

1. Antimicrobial Activity

The antimicrobial activity of Hibiscus rosa-sinensis extracts was examined against Gram positive and Gram-negative bacteria and fungal strains by measuring zone of inhibition. The leaf extract showed high activity against Staphylococcus aureus at very low concentration (2.5 μ g/ml) compared to E.coli, Bacillus subtilis. Leaf extract also showed high activity against Candida parapsilosis at a very low concentration (2.5 μ g/ml) compared to Aspergillus niger. The Hibiscus rosa-sinensis root extract showed high activity against all the tested bacteria at very low concentration (2.5 μ g/ml). Root extract showed high activity against Candida parapsilosis and Aspergillus niger at a very low concentration (2.5 μ g/ml) compared to Trichophyton rubrum. The flowers extract showed activity against E.coli and Staphylococcus aureus (12 mm) at low concentration (2.5 μ g/ml). Flower extract also showed high activity against Candida parapsilosis and Aspergillus niger at a low concentration (2.5 μ g/ml) [7].

2. Anti-inflammatory

Ethanol extract of dried leaves administered intraperitoneally to rats at a dose of 100.0mg/kg, was active against carrageenin – induced pedal edema. Vivek tomer et al explains the anti inflammatory activity of hibiscus rosa sinensis. So many inflammatory conditions such as inflammation of blenorhorea, bronchitis and oral mucosa is treated by Hibiscus rosa sinensis. For anti-inflammatory activities, the methanolic extract of hibiscus rosa sinensis leaves were used. Indomethacin is used as standard against carrageen and dextran induces inflammation.[8].

3. Antipyretic Activity

Antipyretic activity 24 Sawarkar. A.R et al studied about the effect of Hibiscus rosa sinensis as an anti pyretic in rats. The antipyretic activity was determined by using the leaves of Hibiscus rosa sinensis and wistar rat. Aqueous and alcoholic extract of Hibiscus rosa sinensis were used to reduce the increased temperature and compared with the control group. Wound healing activity 25 B.Shivnanda Nayak et al performed.[9].

4. Wound Healing

Their study on Sprague dawley rat by using hibiscus rosa sinensis having wound healing activity, Ethanolic extract of Hibiscus rosa sinensis was used. Study indicate that there was 86 % reduction in wound area in those animals which were treated with ethanolic extract of Hibiscus rosa sinensis when compared against control.[10].

5. Anti Cancer

Oral cancer cell lines KB were treated with 75 μ g and 125 μ g of h. rosa sinensis oil extract for 24 hours. After subjecting the treated cells to be DNA fragmentation assay, and using agarose gel electrophoresis, it was observed that the cells DNA

from the both concentration has been fragmented compared to control sample. This means that hibiscus extract hindered the growth and proliferation of oral cancer cell. [11].

6. Anticonvulsant Activity

V.S.Kasture et al cover the data on the ethanolic extracts of flower of Hibiscus rosa sinensis which is used to exhibit anticonvulsant activity. The anticonvulsant activity lied in the acetone soluble part of ethanolic extract of Hibiscus rosa sinensis flower according to bioassay guided fractionation. This fraction saves the animals from lithium-pilocarpine, electro shock and kindling, and pentylene tetrazole which are responsible for for inducing convulsion in mice. It was proved that the ethanolic extract of Hibiscus rosa sinensis showed significant anticonvulsive activity.[12].

7. Dermatological Effect

The wound-healing activity of the ethanolic extract of the flowers of Hibiscus rosa-sinensis (5 and 10% w/w) was studied in rats using three different models (excision, incision and dead space wound). The extract increased cellular proliferation and collagen synthesis at the wound site, as evidenced by increase in DNA total protein and total collagen content of granulation tissues. The extract-treated wounds were found to Chemical constituents, pharmacological effects and therapeutic importance of Hibiscus rosa-. heal much faster as indicated by improved rates of epithelialization and wound contraction. The extract of Hibiscus rosa-sinensis significantly ($P < 0.001$) increased the wound-breaking strength in the incision wound model compared to controls. The extract-treated wounds were found to epithelialize faster, and the rate of wound contraction was significantly ($P < 0.001$) increased as compared to control wounds. Wet and dry granulation tissue weights in a dead space wound model increased significantly ($P < 0.001$) [13].

8. Hair Growth Promoting Activity

The petroleum ether leaf extract of Hibiscus rosa sinensis was proven to be a good hair growth promoter in a study involving Wister albino rats. After 14 days, the 5% w/w extract ointment resulted in 4.91 ± 0.261 mm hair length compared to 6.06 ± 0.431 mm in 2% minoxidil treated group, and 2.21 ± 0.108 mm in negative control group. The extract also contributed to 1937 ± 37.84 hairs per cm^2 area, while Minoxidil gave 2315 ± 05.78 hairs per cm^2 area. The alopecia was induced by exposure to sonic stress, and there were no side effects such as erythema or edema, compared to synthetic hair growth promoting ointment. Similarly, 5% hydrochloric leaves extract exhibited 5.97 ± 0.13 mm hair length, and 2058 ± 19.23 hairs per cm^2 area.[14].

9. Antifungal Activity

According to previous studies, the methanol extracts prepared from the leaves of the Hibiscus rosa-sinensis were shown to have antimicrobial activities against *Candida albicans*, *Aspergillus niger*, *Candida parapsilosis* and *Trichophyton rubrum*. Using well diffusion method and after an incubation period of 24 hours at 37°C , the maximum observed zone of inhibition was 9.3 ± 0.57 mm and it was against *Aspergillus niger* followed by 6.6 ± 0.57 mm against *Candida albicans* at $80 \mu\text{g/ml}$ concentration of of leaves methanolic extract. These fungi were obtained from infected skins, and the chemical compounds responsible for the antifungal activity may be due to flavonoids, tannins, terpenoids, saponins, or alkaloids identified in the study.[15]

10. Antioxidant Effect

Antioxidant potential of different solvent extracts of Hibiscus rosa-sinensis was evaluated by estimation of total flavonoids contents, total phenolic contents, DPPH free radical scavenging activity and percentage inhibition of linoleic acid oxidation capacity. Methanol and ethanol extract of Hibiscus rosa-sinensis showed total phenolic 61.45 ± 3.23 and 59.31 ± 4.31 mg/100g as gallic acid equivalent, total flavonoids 53.28 ± 1.93 and 32.25 ± 1.21 mg/100g as catechine equivalent. DPPH free radical scavenging activity was 75.46 ± 4.67 and $64.98 \pm 2.11\%$ and inhibition of linoleic acid oxidation potential 75.8 ± 3.22 and $61.6 \pm 2.01\%$ respectively.[16]

11. Anti-haemolytic Effect

The anti-haemolytic activity of *Hibiscus rosa-sinensis* flowers was investigated in vitro. The flower extract at various concentrations was incubated with erythrocytes and analysed for hydrogen peroxide induced hemolysis and lipid peroxidation as indices of erythrocyte damage. The extract significantly reduced hydrogen peroxide induced hemolysis and lipid peroxidation in vitro [17]

12. Urinary Effect

The aqueous extract of flowers of *Hibiscus rosa-sinensis* was evaluated for antilithatic potential in vitro. The presence of calcium oxalate crystals was evaluated immediately and after 24 hrs. of stone induction. Crystal aggregation after 24 hrs. was inhibited by *Hibiscus rosa-sinensis* extract. The extract interfered with early stages of stone formation and may represent an alternative form of treatment and or prevention for urolithiasis [18].

13. Antitussive Effect

The methanolic extract of *Hibiscus rosa-sinensis* was evaluated for antitussive activity in histamine chamber using citric acid (7.5%W/V) induced cough model. The methanolic extract of *Hibiscus rosa-sinensis* and codeine significantly decreased the number of coughing [19].

II. RESULT AND CONCLUSION

The current review discussed the chemical constituents, pharmacological effects and therapeutic importance of *Hibiscus rosa-sinensis* as a promising medicinal plant with wide range of pharmacological activities which could be utilized in several medical applications because of its effectiveness and safety. According to the obtain data it is conclude that the extract was *hibiscus roesus* have pharmacological activity. The plant is effective for herbal alternative to many disease such as antipyretic, antiparasitic, antimicrobial, Anti-inflammatory, hair growth promoting, wound healing activities, anticonvulsant, antioxidant, etc.

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